UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,973	01/16/2002	Toru Kitayama	393032030300	1562

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EXAMINER
WARREN, DAVID S

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/051,973	KITAYAMA ET AL.
	Examiner	Art Unit	
	David S. Warren	2837	_KV_

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _17 February 2004_.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under _Ex parte Quayle_, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-48 and 50-53_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) _27-40 and 50-52_ is/are allowed.
6) ☒ Claim(s) _1-26,41-48,53_ is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on _16 November 2002_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☒ All b)☐ Some * c)☐ None of:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. _____.
    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 41 - 48 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Katoh (4794837). Regarding claim 41, Katoh shows the use of dividing a waveform into sections (a PCM section and a DPCM section shown in figure 6). Katoh then adds these sections for form a complete waveform with a continuous envelope that attenuates with the passage of time. Both the PCM and DPCM data are stored (see elements 22A, 22B). The DPCM data is *added* to the PCM data, the DPCM data *attenuates with the passage of time* (fig. 6). Regarding claims 43 and 48, playing at a faster tempo (i.e., before allowing the portion of the sustain or decay or DPCM to sound), the DPCM section of the Katoh waveform would not be added to the attack portion of the envelope. The applicant is reminded that since note length also determines envelope shape (envelope shape includes sustain and release) that both tempo and note length may be used to determine whether additional stored waveforms

are added to the overall envelope. Regarding claims 47 and 48, Katoh shows the use of a storage means to store waveform data (20). Katoh also shows that the added section attenuates from an initial value equal to the envelope level at the end of the previous section (see fig 6). Regarding claims 45 and 46, Katoh shows the use of a code (see elements 6 and 7); the computer is inherent (e.g., code, address generators, memory, registers, etc.). Regarding claim 42, Katoh uses an address signal to match the attenuation rate of the envelope waveform. The applicant also matches the envelope but uses a detection format. Since it is crucial to match the envelope waveform between sections (otherwise the musical tone would sound unnatural and unpleasant), the applicant's envelope detecting scheme is deemed to be a design choice. (Note: The examiner believes that the applicant meant to have claim 42 depend from claim 41 and not from claim 1. This appears to be what the applicant intended since claim 42 and 41 have similar preamble and claim 41 provides proper antecedent for all claim 42 elements.) Regarding claim 44, the waveforms stored in Katoh's memory are considered to be the "standard."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. ('687) in view of Miyake ('832). Both Yamada and Miyake disclose detecting beat information from audio waveform data. Miyake discloses an apparatus for detecting a dividing position (Miyake's dividing positions are also considered to be beat positions) and the synchronization of the dividing data with audio output data. Miyake accomplishes this by detection of the envelope (see fig. 3) and the use of a storage device (7) and a processor (3). Figure 3 of Miyake also shows that a range within the "rise" portion of the envelope is used to determine beat and dividing positions. Miyake also discloses recording the audio into the storage means (col. 2, line 53), hence the step of "read out the original waveform data" is inherent (e.g. applicant's claims 10 and 12). Miyake does not teach the use of filtering the audio signal prior to detecting a dividing (or beat) position. Yamada discloses the use of a filter (2) to obtain peak values of the audio input waveform without spurious results. Nor does Miyake teach the use of differentiation of the envelope waveform to determine dividing positions (regarding applicant's claims 4 and 12). However, Miyake does teach the use of threshold values in the "rise" (i.e., attack) portion of the waveform envelope. These methods (i.e., detecting a threshold value or differentiating the rise portion of the envelope) are considered functionally equivalent. It would have been obvious to one of ordinary skill in the art to add a filter to the input of Miyake to obtain a beat position (or dividing position) determining method and apparatus. The motivation for this combination is in the Yamada teachings that use the filter to remove high frequencies that may complicate the detection of each beat. Regarding claim 2, since the tempo of

Miyake is modified, the beat positions are compressed (increase in tempo) or expanded (decrease in tempo). Regarding claim 4, Yamada "converts" the envelope amplitude via a peak holding circuit (3), i.e., the peak holding circuit will reduce *all* level differences. Regarding claim 5, Yamada uses peak detectors to establish beat (or dividing) positions (3). The delay limitation of applicant's claims 6 and 7 are functionally equivalent to that of the Miyake reference since synchronization is necessary at any chosen tempo, i.e., the two pieces of music must begin at the same time, while keeping beats in synchronization. Regarding claims 14, 15, 19, and 20, Miyake shows the use of a threshold level, above and/or below this level is considered a chosen range and since this is a "beat detector" this chosen range will occur at each beat, i.e., regular intervals and in accordance with rhythm tempo. Regarding claims 16 and 21, Miyake shows the use of two thresholds (fig. 3); one for determining the trigger amplitude and one for calculating attack offset. Regarding claims 8, 9, 23, and 24, Miyake shows the use of a computer (3); the use of a computer program code is inherent. Regarding claim 49, both the Yamada and Miyake reference disclose detecting beats from any musical instrument, this includes both percussion instruments and those that perform sustained notes.

Allowable Subject Matter

Claims 27 – 40 and 50 - 52 allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose the method of receiving a musician generated waveform and converting it into waveform data synchronously with a generated sound and tempo clock, storing the waveform data in parallel with automatic performance information, and the step of recording synchronization control data indicative of successive time relationship between the automatic performance information reproduced successively and the waveform data stored successively in correspondence with storage of the waveform data. .

Response to Arguments

Applicant's arguments filed February 17, 2004 have been fully considered but they are not persuasive. Regarding applicant's argument pertaining to claims 41 - 48 and 53, the term "original" in the independent claims does not overcome the Katoh rejection. The waveform stored by Katoh can reasonably be interpreted as being "original" since any musical performance will begin (or originate) with waveforms stored in elements 22A and 22B. The examiner understands that this may not be as intended by the applicant, however, the specification does not provide a clear definition of the term "original" waveform. Perhaps the applicant intended this to mean an original "audio" waveform, if so, it is suggested that this feature be more clearly defined within the claim language. The applicant is reminded that if this feature is added to the claim, a new prior art search would be required. The applicant also argues that katoh "does

not even slightly teach or suggest adding waveform data of an additional section to each of the divided PCM and DPCM waveform data; in fact, Katoh does not teach or suggest adding waveform data whatsoever." Katoh "adds" waveform data in two ways; 1) the DPCM data is added to the PCM data (in other words, the sustain portion is added to the attack portion – see col. 9, lines 34 - 40), and 2) Katoh discloses "a waveshape of one period is read out repeatedly by a predetermined period number or time...being sequentially shifted" (this is interpreted as sequentially *adding* a one-period waveform to a previous one-period waveform). The examiner did not intend to "vitiate" the limitation of claim 41 by arguing the coding formats are used for "purposes" of adding attenuating additional sections. However, fig. 6 of Katoh clearly shows an attenuating envelope, while Katoh also shows adding one-period waveforms.

As stated in the previous Office Action, tempo and time are inextricably linked. While Katoh does not explicitly disclose adding (or not adding) waveforms in accordance with a particular tempo, it is clearly disclosed that waveshapes of one period are read out for a predetermined time (col. 9, line 5). It is inconceivable that a musical instrument, as taught by Katoh, would not allow for tempo variations by making, say, a quarter note shorter for fast tempo pieces or longer (via addition of waveform periods) for slower tempos – otherwise, a musician could not perform music at different tempos. (See applicant's specification, page 18, paragraph 3, which appears to agree with this analysis.)

Regarding claims 1 and 10, the limitations of "sustain-sound-related waveform type" and "percussion-sound-related waveform type" are not clearly defined in the

specification and are interpreted as follows: A "sustain-sound-related waveform type" is interpreted by the Examiner to mean a waveform of long duration (the applicant merely states on page 32 of the specification that the sustain-type waveform does not have regular attenuation). A "percussion-sound-related waveform type" is interpreted as a short duration waveform. However, "short" and "long" are relative terms, the examiner has no standard for comparison. As such, the teachings of Yamada will "designate" either a short or long waveform type. Section 2.2.6 of Applicant's specification does not provide a definition but discloses how such waveform types can be manipulated. The applicant argues that neither Yamada nor Miyake "designate a particular type of waveform from amongst a plurality of waveforms" Yamada discloses detecting beats of waveforms that have a maximum value (i.e., the waveforms that exceed the "slice level").

Regarding claims 13, 18, 25, and 26 the phrase "predetermined range" is a relative term and is not clearly defined. The examiner broadly interprets "predetermined range" to be the entire rise time (from a minimum value to a maximum value) of the original waveform, the peak value (as detected by Yamada) would then lie within the "predetermined range." Furthermore, Yamada discloses detecting signals output from the BPF that exceed the "slice value" (col. 3, lines 35 and 36).

Most of the applicant's arguments art drawn to limitations such as the "original waveform," "designating a waveform," and "predetermined range." As stated above, these terms do not clearly delimit the claimed invention over the prior art of record. The applicant's specification does not clearly define these terms in a way the Examiner

could allow the claims over the prior art. How does applicant define "original"? Katoh stores an original PCM and DPCM waveform. The term "designate" can mean to name, e.g., a PCM waveform. Furthermore, "sustain-type" and "percussion-type" waveforms are not clearly defined. Does the applicant mean waveforms that pertain to percussion instruments, such as drums and cymbals? If so, cymbal waveforms can have an extremely long sustain (over 10 seconds), similar to any "sustain-type" instrument (e.g., a piano). Or does the applicant mean waveform duration, such as percussive attack on, say, a guitar string? The examiner concurs that there may be allowable subject matter in the claims that stand rejected, however, as claimed, the prior art of record appears to meet the limitations thereof.

Finally, the Examiner does not intend to "vitiate" applicant's claims, but instead requests clarification. The applicant is encouraged to contact the Examiner with any questions or comments at the telephone number below.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Warren whose telephone number is 571-272-2076. The examiner can normally be reached on M-F, 9:30 A.M. to 6:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2800 ext 37. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dsw

MARLON T FLETCHER
PRIMARY EXAMINER